HD Plus Connectors: Manufacturing Assembly Criteria

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ABSTRACT: This specification establishes the acceptance criteria for the assembled HD Plus series connector. This specification also provides directions and measurement techniques for meeting these criteria.

APPLICABILITY: These acceptance criteria apply to all variations of the Teradyne HD Plus connector family assembled to modules and backplanes.

STATUS: APPROVED 21-Jan-1991; use VTX SMC for current status.

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1 INTRODUCTION

The Teradyne HD Plus series connector places new demands on all organizations involved with the implementation of these connectors into products, from Design through Customer Service. Manufacturing plants that assemble these connectors to modules and backplanes share in these demands. This specification assures that modules and backplanes assembled with this type of connector mate well when assembled into card cages in Stage II manufacturing operations.

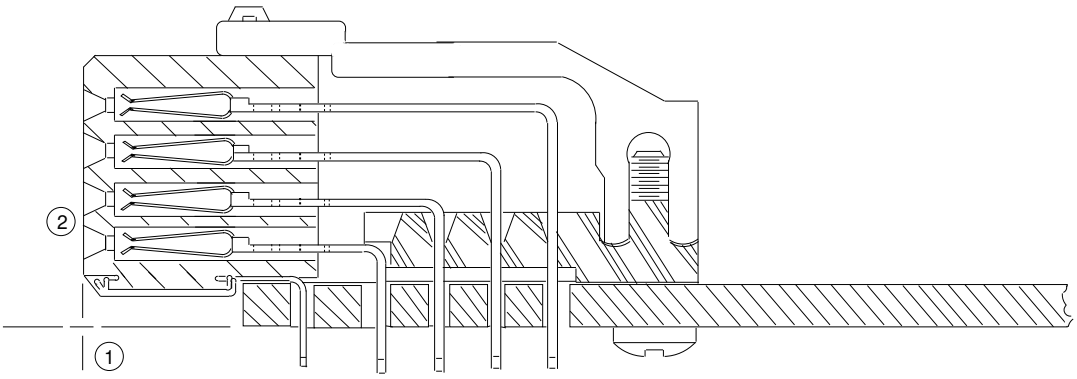
This specification establishes the acceptance criteria for the assembled HD Plus connector. It also provides recommendations for accomplishing quality assembly level and provides recommendations for measuring these criteria.

2 ASSEMBLED MODULE CONNECTOR ACCEPTANCE CRITERIA

Refer to Figure 1.

1. Perpendicularity of the connector face shall be 90° ± 0.5 °, or .009 inch/inch, to the plane of the surface of the PWB.
2. The flatness of the connector shall be within .005 inch over the full length of the connector.

Figure 1: Assembled Module Connector Acceptance Criteria



1. Perpendicularity of the connector face shall be 90° ± 0.5° to the plane of the surface of the PWB.

2. The flatness of the connector face shall be within .005 inch over the full length of the connector.

3 ASSEMBLED BACKPLANE CONNECTOR ACCEPTANCE CRITERIA

Refer to Figure 2 and Table 1.

Figure 2: Acceptance Criteria Parameters

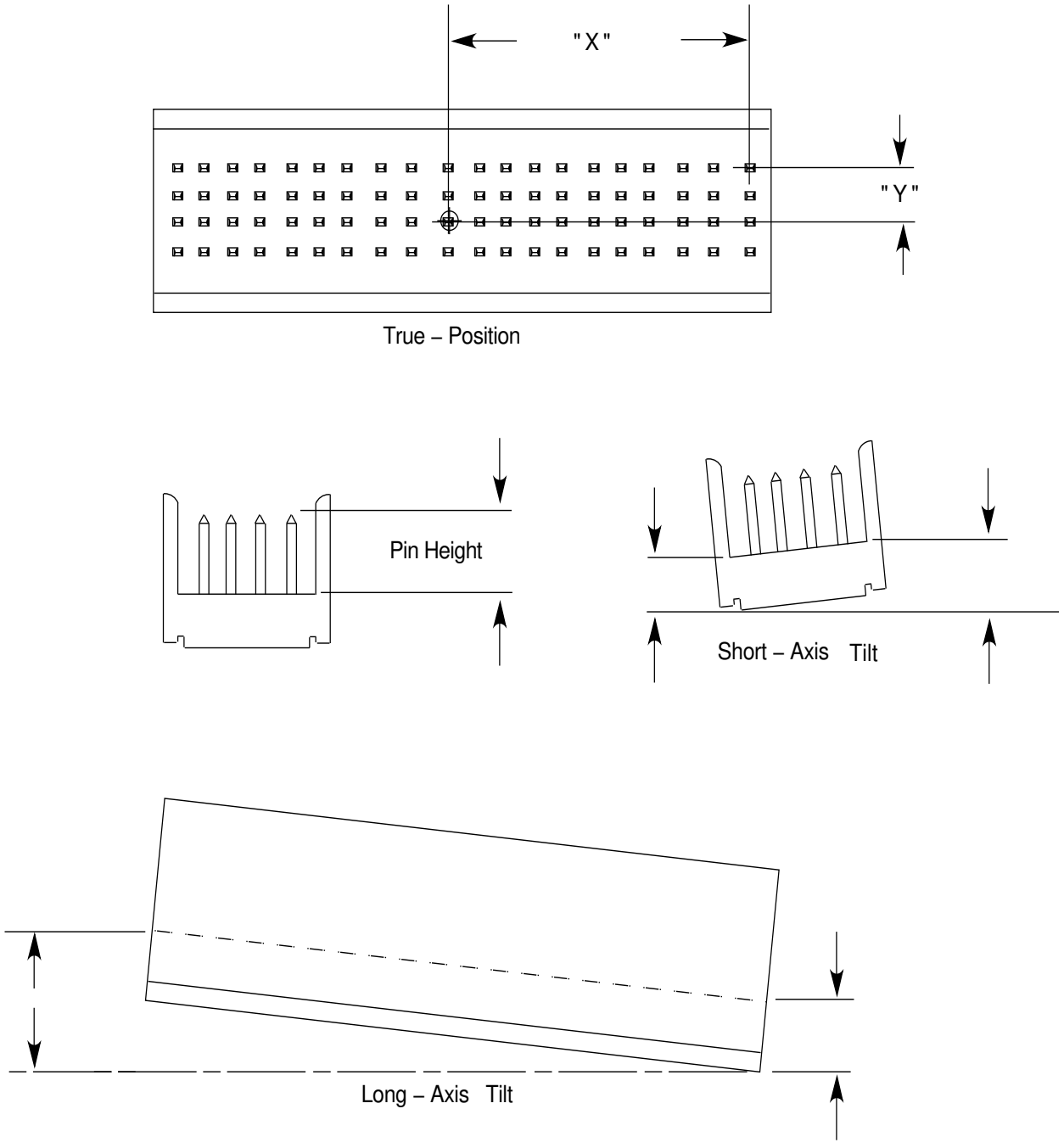


Table 1: Acceptance Criteria

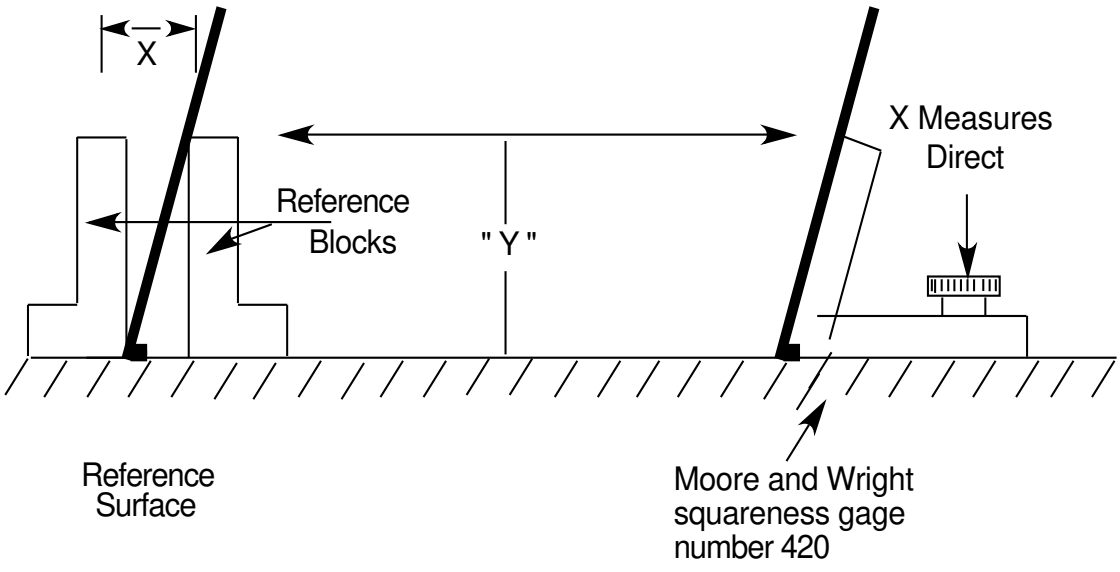
Parameter	Acceptance Criteria
Pin True-Position Diameter	.008 inch
Pin-Tip Height From the Plane of the Connector Bottom	
Part Number 12-28007-xx (four row)	240 inch ± .004 inch
Part Number 12-28008-xx (four row)	240 inch ± .004 inch
Part Number 12-31620-xx (four row)	240 inch ± .004 inch
Connector Short-Axis (Side-to-Side) Tilt	.006 inch for the four signal-row connector and .006 inch for the three signal-row connector.
Connector Long-Axis (End-to-End) Tilt	Shall not exceed .005 inch for any length 2-piece connector, regardless of width.

4 ASSEMBLED MODULE MEASUREMENT RECOMMENDATIONS

4.1 CONNECTOR PERPENDICULARITY

Refer to Figure 3. Stand the module vertically, with the connector face flat on the reference surface, and measure the horizontal and vertical distance to a point on one side of the module, preferably at least three inches from the surface of the table.

Figure 3: Measuring Module Perpendicularity


X
X Measures Direct
Reference Blocks
" Y "
Reference Surface
Moore and Wright squareness gage number 420
Method A
Dev. = arctan (X – PWB thickness) / Y
Method B
Dev. = arctan (X / Y)

For warped PWBs, it may be necessary to first determine the amount of warpage at the point of measurement and apply a correction to the X dimension before using the equation.

4.2 CONNECTOR FACE FLATNESS

Stand the module vertically with the connector face flat on a reference surface. Use a feeler gage, or other known thickness measuring device, to measure the gap between the connector face and the reference surface. The gap should not exceed .005 inch.

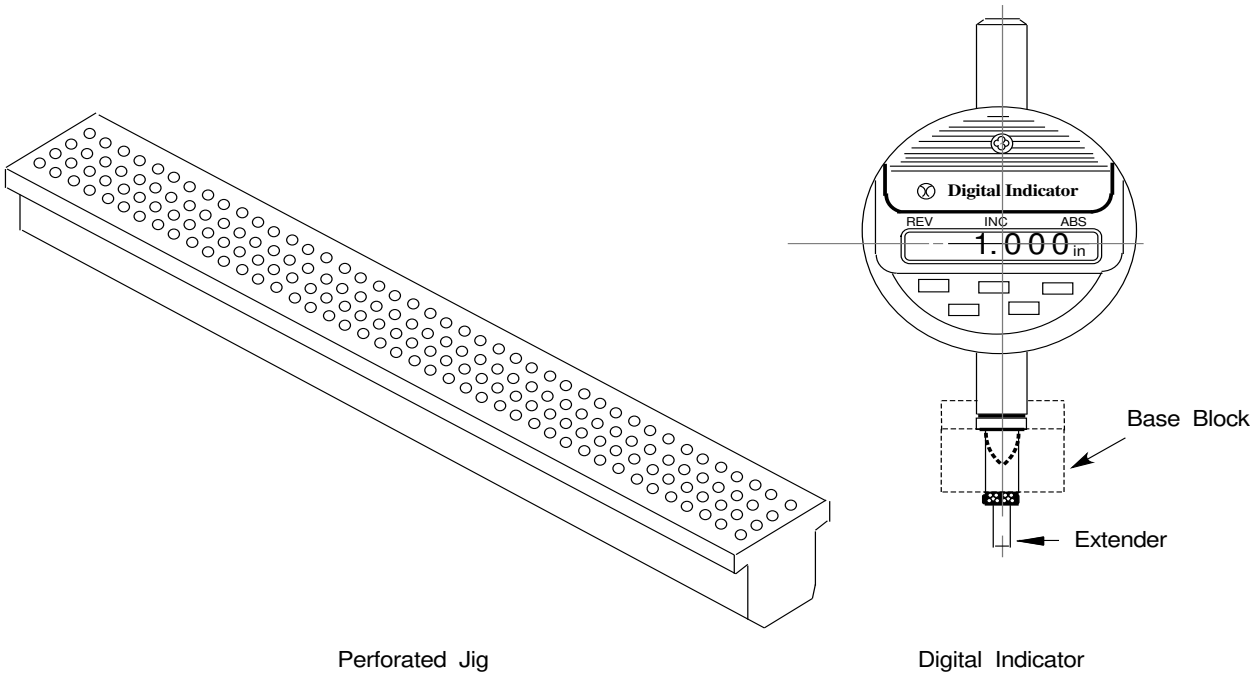
5 ASSEMBLED BACKPLANE MEASUREMENT RECOMMENDATIONS

The four parameters: pin true-position, pin length, short-axis, and long-axis tilt, that determine the acceptability of the assembled unit can be measured relatively quickly and easily, using simple tools.

5.1 PIN TRUE-POSITION

Acceptance is determined by inserting the Perforated Jig, shown in Figure 4, into the assembled connector. The jig is designed so that if the jig slips easily over the pins under its own weight, the pin tips meet the true-position requirements.

Figure 4: Measurement Tools



NOTE

The length of the assembled connector, and whether it uses 3- or 4-pin rows, will determine the configuration of the jig.

5.2 CONNECTOR PIN LENGTH

With the jig in position and resting on the bottom of the connector, the length of the pin from the plane of the bottom of the connector can be determined by either of the following two methods:

a. By measuring the distance from the top surface of the jig to the pin-tip, and subtracting this measurement from the jig thickness or

b. By presetting the digital indicator to provide a direct measurement of the height of the pin-tip. The recommended digital indicator, shown in Figure 4, incorporates this optional direct-reading method.

5.3 SHORT-AXIS TILT

With the jig in position and resting on the bottom of the connector, the short-axis tilt, across the width of the connector, can be measured with the the probe-tip extender installed, as follows.

1. Position the base block on the top of the jig with the tip extender over the side of the connector and contacting the surface of the PWB.
2. Read the indicated measurement, and repeat the procedure for the other side of the connector. The difference between the two readings is a direct measure of the short-axis tilt.

CAUTION

Avoid contacting etch or plated-through-holes. These features can produce errors when measuring tilt.

5.4 LONG-AXIS TILT

With the jig in position and resting on the bottom of the connector, the long-axis tilt, across the length of the connector, can be measured as follows, with the probe-tip extender installed.

1. Position the base block on the top of the jig with the probe-tip extender over the end of the connector and contacting the surface of the PWB.
2. Read the indicated measurement, and repeat the procedure for the other end of the connector. The difference between the two readings is a direct measure of the long-axis tilt.

6 ASSEMBLY PROCESS RECOMMENDATIONS

6.1 MODULE CONNECTOR ASSEMBLY

Wavesoldering is the preferred assembly method. If this method is not possible, then the use of a stationary soldering machine, such as the Wenesco, is recommended. This type of machine also serves as a repair tool for either whole connectors or connector segments.

To meet the 90° ± 0.5 °, perpendicularity requirement for the assembled module connector, low torque is recommended, such as 2 to 4 inch-pounds, when mounting the connector hold-down screws and apply a light pressure, such as 0.5 to 2.0 pounds, to the top front

of the connector when wave soldering. Toggle clamps provide a simple means of applying light pressure.

6.2 BACKPLANE CONNECTOR ASSEMBLY

Ganged insertion of the full connector is recommended to provide uniform seating and alignment for each connector segment.

The pressure requirements of the press can be estimated by using the maximum insertion pressure of 35 pounds/pin.

Arbor presses are not recommended for volume production. The relatively low pressures attainable with this type of press and the irregularity of the pressure applied can cause poor connector alignment and seating and lead to a rejectable product.

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